UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHARILAOS CRISTOPOULOS
and ATHANASIOS SKODRAS

Appeal 2007-2758
Application 09/394,428
Technology Center 2600

Decided: November 20, 2007

Before HOWARD B. BLANKENSHIP, MAHSHSID D. SAADAT,
and ROBERT E. NAPPI *Administrative Patent Judges*.

NAPPI, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 6(b) (2002) from the rejection of claims 2, 11, 14, 16, 19, 22, 23, 25, and 26. We reverse and enter a new rejection.

INVENTION

The invention is directed to a method for computing the Discrete Cosine Transformation of digitized image data for transcoding and providing scalable

video coding. See page 1 of Appellants' Specification. Claim 2 is representative of the invention and reproduced below:

> 2. An encoder or decoder comprising:
> - first processing circuitry for calculating a discrete cosine transform (DCT) of length N/2 x N/2, N being a positive, even integer, to produce four sequences of coefficients, and
> - second processing circuitry for calculating a DCT of length N x N directly from the four sequences of coefficients.

REFERENCES

Lee	US 5,107,345	Apr. 21, 1992
Zhu	US 5,870,146	Feb. 9, 1999

REJECTIONS AT ISSUE

Claims 2, 11, 14, 16, and 19 stand rejected under 35 U.S.C. § 102(b) as being unpatentable over Lee.[1] The Examiner's rejection is set forth on pages 3 and 4 of the Answer dated January 15, 2004.

[1] We note that the Examiner has issued three Examiner's Answers. The January 15, 2004 Examiner's Answer, the Appellants' Brief dated November 14, 2003 and the non-final rejection dated July 15 2003 (the Office action being appealed) all identify claims 2, 11, 14, 16, and 19 as rejected under 35 U.S.C. § 102(b). The two more recent Examiner's Answers dated January 12, 2006 and May 30, 2006 identify that claims 1, 2, 4, 10, 11, 12, 14 through 16, and 18 through 21 as rejected under 35 U.S.C. § 103(a), a rejection made in an office action mailed prior to the July 15, 2003 Office action. These Examiner's Answers improperly state the rejection because: a) they erroneously identify that they are in response to an Appeal Brief filed May 7, 2003 (there is no paper of record filed on May 7, 2003); and, b) refer to rejections made in the prior Office actions (which if were meant to be applied by the Examiner, would be an improper new rejection on appeal, as the Answers are not signed by the Group Director).

Claims 22, 23, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Zhu. The Examiner's rejection is set forth on page 4 and 5 of the Answer.

Throughout the opinion, we make reference to the Brief (received November 14, 2003), and the Answer (mailed January 15, 2004)[2] for the respective details thereof.

ISSUES

Appellants argue that "Lee does not disclose calculating higher-order DCT coefficients from lower-order DCT's. In other words, Lee does not teach calculating 16 x 16 DCT coefficients from 8 x 8 DCT coefficients." (Br. 7.) Appellants state that independent claims 2, 11, 14, 16, and 19 require calculating a DCT of length N x N directly from four sequences of DCT coefficients of length N/2 x N/2.

The Examiner responds to these arguments stating:

> In response, with respect to appellant's argument, Lee '345 discloses dividing the block into sub-blocks and performing DCT (calculating) by properly choosing the block size based on the image characteristics being dictate by the process, and reconstruct back to the original block of N x N. For example figures 1 and 6, where a 16 x 16 size block is broken-down into up 4(8 x 8) (i. e. N/2) or 16(4 x 4) (i.e. N/4) or combination thereof, and the reconstruction is selecting/choosing the block size based on the image characteristics back to the original block (fig. 1, 10b, and QC8) where a 16 x 16 (4 x (8 x 8)) blocks are produced from 8 x 8 DCT block (10b)

(Answer 6.)

We disagree with the Examiner's findings. Claim 2 recites "calculating a discrete cosine transform (DCT) of length N/2 x N/2… to produce four sequences

[2] See footnote 1 regarding the Examiner's Answers dated January 12, 2006 and May 30, 2006.

of coefficients" and "calculating a DCT of length N x N directly from the four sequences of coefficients." Independent claims 11, 16, and 19 recite a similar limitation wherein a DCT of N x N is calculated from four DCT's of length N/2 x N/2. Lee teaches an adaptive block size DCT technique. (Col. 7, ll. 30-35.) Lee teaches that a 16 x 16 block is used to form several discrete cosine transforms for different size pixel blocks, e.g. 2 x 2 DCT, 4 x 4 DCT, 8 x 8 DCT and 16 x 16 DCT. See fig 1, items 10a-10d, column 9, lines 9-30. These DCTs are then quantized and the number of bits needed to code each block is determined. (Col. 9, ll. 31-54, col. 10, ll. 15.) This is used to create block assignments which are then used to create a composite block of DCT coefficients. (Col. 12, ll. 59-63.) The composite block may be composed of 2 x 2, 4 x 4 and 8 x 8 subblocks. See figure 2, column 12, lines 63-68. While Lee teaches that these subblocks can be used to recreate the original 16 x 16 pixel block, we do not find that Lee teaches using values in the subblocks to create the DCT of the 16 x 16 block. Accordingly, we will not sustain the Examiner's rejection of claims 2, 11, 14, 16 and 19.

Appellants argue on pages 8 through 11 of the Brief that independent claims 22, 23, 25, and 26 similarly recite calculating DCTs for blocks of size N/2 x N/2 and using the calculated coefficients to calculate DCTs for blocks of size N x N. Appellants argue that for the reasons discussed with respect to claim 2, the combination of Lee and Zhu does not teach this limitation.

The Examiner relies upon the same reasoning discussed above with respect to claim 2 to support the rejection of claims 22, 23, 25, and 26. Accordingly, for the reasons discussed above with respect to claim 2 we will not sustain the Examiner's rejection of claims 22, 23, 25 and 26.

NEW GROUNDS OF REJECTION PURSUANT TO 37 C.F.R. § 41.50(b)

37 C.F.R. § 41.50(b) states:

> (b) Should the Board have knowledge of any grounds not involved in the appeal for rejecting any pending claim, it may include in its opinion a statement to that effect with its reasons for so holding, which statement constitutes a new ground of rejection of the claim. A new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.

In light of our reviewing court's recent decision in *In re Comiskey,* we now reject claims 1 through 4, 9, 10 through 21 under 35 U.S.C. § 101.

Appellants' independent claims 11, 12, 15, 16, 19, and 21 are directed to a method of encoding an image and recites steps to calculate a discrete cosine transform (DCT) of the image. Appellants' Specification describes the method of encoding/decoding as being used in transmission and reception of video images which allows for video viewing amongst users with different bandwidth or computational requirements. Appellants' originally filed Specification pages 1 and 2. However these claims do not recite how the calculated DCTs are used. We consider that, independent claims 11, 12, 15, 16, 19, and 21, by merely reciting algorithms to manipulate image data, only limit the claims to an abstract process, and do not recite a practical application for the data manipulation algorithm. Accordingly, we consider claims 11, 12, 15, 16, and 21 as not patentable under 35 U.S.C. § 101.

Our reviewing court has recently stated:

> The prohibition against the patenting of abstract ideas has two distinct (though related) aspects. First, when an abstract concept has no claimed practical application, it is not patentable…
>
> Second, the abstract concept may have a practical application. The Supreme Court has reviewed process patents reciting algorithms or abstract concepts in claims directed to industrial processes. In that context, the Supreme Court has held that a claim reciting an algorithm or abstract idea can state statutory subject matter only if, as employed in the process, it is

> embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter. 35 U.S.C. § 101.

In re Comiskey 499 F.3d 1365, 1376 (Fed. Cir. 2007).

Even when a claim applies an abstraction, as part of a seemingly patentable process, it must be determined that the claim does not in reality seek patent protection for the abstraction. *Diamond v. Diehr*, 450 U.S. 175, 191 (1981). "Phenomena of nature, though just discovered, mental processes, abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). One may not patent a process that comprises every "substantial practical application" of an abstract idea, because such a patent "in practical effect would be a patent on the [abstract idea] itself." *Benson*, 409 U.S. at 71-72; *cf. Diamond v. Diehr*, 450 U.S. at 187 (stressing that the patent applicants in that case did "not seek to pre-empt the use of [an] equation," but instead sought only to "foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process".) "To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection." *Diehr*, 450 U.S. at 192.

Independent claims 11, 16, and 19 recite an algorithm which includes steps of undersampling compressed frames and calculating a DCT. Claims 12, 15, and 21 similarly recite an algorithm for calculating a DCT. These claims also recite limitations directed to the attributes of the data input to the calculation and attributes of the data calculated (e.g. size and number of sequences). However, independent claims 11, 12, 15, 16, 19, and 21 recite no practical application for the algorithm, nor do the claims recite that the algorithm is employed in the process,

embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter as noted in *Comiskey*.[3] We do not consider encoding or decoding of the image data using the algorithm of calculating DCTs to be a practical application because, as claimed, it is a disembodied act which is not related to any device which performs the encoding or decoding, nor do the claims recite transforming another statutory class of subject matter.[4] Thus, we consider the limitations of independent claims 11, 12, 15, 16, 19, and 21 to recite an algorithm which is not patentable subject matter under 35 U.S.C. § 101 as the limitations are not drawn to any practical application and do not recite operating on or involving any other statutory class of invention. Not every series of steps is a "process" under § 101. *Benson*, 409 U.S. at 64 ("The question is whether the method described and claimed is a 'process' within the meaning of the Patent Act.").

Dependent claims 13, 14, 17, and 18 recite limitations which further limit the steps of the algorithm. As such, they do not limit the algorithm to operating on or involving any other statutory class of invention. Further, these claims do not recite any practical application of the algorithm.

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[3] We note that the claims recite the act of encoding or decoding and are not drawn to any device which performs the encoding or decoding.

[4] We note that it is not clear whether application of the "concrete, useful and tangible result" test of *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998) and *AT&T Corp. v. Excel Commc'ns, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) is necessary to determine whether a claim is drawn to statutory subject matter. In *In re Comiskey*, the Federal Circuit appears to agree with the U.S. Patent and Trademark Office's position that the test articulated in *State St.* and *AT&T* is limited to inventions that are directed to the transformation of data by a machine. *Comiskey* 499 F.3d at 1377 n.14. In any case, we do not find that independent claims 11, 12, 15, 16, and 21 recite a tangible result, as we do not find that the calculation of a DCT to be tangible result.

Independent claims 1, 2, and 20 similarly recite an algorithm to calculate DCTs of an image. Independent claims 1 and 2 also recite an encoder or decoder which contains circuits to perform the calculations. Independent claim 20 recites means for performing the calculations. Appellants' Specification on pages 5 and 6 describes the calculations as being performed in an MCU.[5] Further, Appellants identify, on page 7 of the Specification, that the calculations can be performed by software code. Interpreted in light of Appellants' Specification, the encoder, decoder and means for calculating, are broad enough to encompass software, which is not an article, machine or manufacture (classes of statutory subject matter under 35 U.S.C. § 101.)[6] Thus, while claims 1, 2 and 20 appear to be drawn to an apparatus (a statutory class of invention), when interpreted in light of the Specification, they recite nothing more than software (i.e. instructions) to perform the recited algorithm. Accordingly, we do not consider claims 1, 2, and 20 to recite that the claimed algorithm is operating on or transforming another class of invention apparatus and we reject these claims under 35 U.S.C. § 101, for the reasons discussed above with respect to the method claims 11, 12, 15, 16, 19, and 21.

Dependent claims 3, 4, 9, and 10 recite limitations which further limit the steps of the algorithm. As such, they do not limit the algorithm to operating on or involving any other statutory class of invention. Further, these claims do not recite any practical application of the algorithm.

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[5] Appellants' Specification provides no description of what constitutes an MCU, nor does it identify the meaning of the acronym.

[6] As identified in footnote 4, it is unclear as to whether the concrete, useful and tangible test applies to these claims. Nonetheless, we do not consider the claims to recite a tangible result, as we do not find that the calculation of a DCT to be a tangible result.

Independent claims 22, 23, 25, and 26, recite limitations similarly directed to an algorithm for determining DCTs, but further recite receiving a bit stream (video signal), and selecting coefficients from the calculated coefficients and transmitting a bit stream (video signal) using only the selected coefficients. Thus, we find that these claims recite a practical application of the algorithm of transforming the bit stream of a digital image and as such are drawn to statutory subject matter. See *Arrhythmia Research Tech. Inc. v. Corazonix Corp.* 958 F.2d 1053, 1059 (Fed. Cir. 1992) (method steps that transform one physical signal to another are statutory.)

CONCLUSION

We reverse the Examiner's rejections of claims 2, 11, 14, 16, 19, 22, 23, 25, and 26. We enter a new rejection against claims 1 through 4, 9, and 10 through 21. The decision of the Examiner is reversed.

1This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

REVERSED - 37 C.F.R. § 41.50(b)

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